

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Cinderella BLANCHAT et al.) Group Art Unit:
Serial No:) Examiner:
Filed:) Attorney Docket No: 7594-83862
(SGcsbF1228/2 US)
For: BIOMATERIAL BASED ON AN)
INSOLUBILISED DEXTRAN)
DERIVATIVE AND A GROWTH)
FACTOR)

CLEAN VERSION OF ENTIRE SET OF PENDING CLAIMS

A clean version of the entire set of pending claims is enclosed in accordance with 37 CFR 1.121 (c) (3).

Each claim of the clean version of the entire set of claims begins on a separate page in order to facilitate optical scanning of the claims by the U.S. Patent and Trademark Office.

1. A solid biomaterial, characterized in that it essentially comprises:

(1) at least one solid support material consisting of at least one insolubilized dextran derivative of general formula $DMC_aB_bSu_cS_d$ in which:

D represents a polysaccharide chain, preferably consisting of successions of glucoside units,

MC represents methyl carboxylate groups,

B represents carboxymethylbenzylamide groups,

Su represents sulfate groups (sulfation of the free hydroxyl functional groups carried by the glucoside units),

S represents sulfonate groups (sulfation of the aromatic rings of the B groups),

a, b, c and d represent the degree of substitution (ds), expressed relative to the number of free hydroxyl functional groups in a glucoside unit of the dextran, respectively in MC, B, Su and S groups; a being ≥ 0.3 , b being equal to 0 or ≥ 0.2 , c being equal to 0 or ≥ 0.1 and d being equal to 0 or ≤ 0.15 , provided that when b is equal to 0, c is not equal to 0, and

(2) at least one growth factor exhibiting activity on the osteoarticular, dental and/or maxillofacial tissues.

3. (Amended) The biomaterial as claimed in claim 1, characterized in that said growth factor is selected from the group consisting of EGFs, IGFs, FGFs, TGF- β s, PDGFs and BMPs.

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4. (Amended) The biomaterial as claimed in claim 1, characterized in that said growth factor has an osteoinductive activity and is a BMP.

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5. (Amended) The biomaterial as claimed in claim 1, characterized in that it comprises several insolubilized dextran derivatives and/or several growth factors involved in the bone reconstruction process.

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7. The biomaterial as claimed in claim 6, characterized in that said crosslinking agent is selected from the group consisting of sodium trimetaphosphate, epichlorohydrin, divinyl sulfone, gluteraldehyde and bisepoxiranes.

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8. (Amended) The biomaterial as claimed in claim 1, characterized in that it exists in the form of a hydrogel.

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9. (Amended) The biomaterial as claimed in claim 1, characterized in that it exists in the form of a freeze-dried powder.

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10. (Amended) The biomaterial as claimed in claim 9, characterized in that said freeze-dried powder is obtained from biomaterial existing in the form of a hydrogel.

11. The biomaterial as claimed in claim 9, characterized in that said freeze-dried powder is obtained from biomaterial existing in the form of a hydrogel.

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11. (Amended) The biomaterial as claimed in claim 1, characterized in that it comprises, in addition, a tissue filling material.

11. (Amended) The biomaterial as claimed in claim 1, characterized in that it comprises, in addition, a tissue filling material.

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13. (Amended) The biomaterial as claimed in claim 11, characterized in that said tissue filling material is selected from the group consisting of collagen, gelatin, biological adhesive, polymers of polylactic or polyglycolic acids, and copolymers of polyethylene glycol and polylactide-co-glycolide.

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14. (Amended) The biomaterial as claimed in claim 11, characterized in that said tissue filling material is an osteoconductive material selected from the group consisting of coral, hydroxyapatite, a mixture of collagen and hydroxyapatite, tricalcic calcium phosphate, calcium sulfate, and calcium carbonate.

14. (Amended) The biomaterial as claimed in claim 11, characterized in that said tissue filling material is an osteoconductive material selected from the group consisting of coral, hydroxyapatite, a mixture of collagen and hydroxyapatite, tricalcic calcium phosphate, calcium sulfate, and calcium carbonate.

15. (Amended) A process for preparing the solid biomaterial as claimed in claim 1, characterized in that the process comprises the following steps:

crosslinking of at least one dextran derivative of general formula $DMC_aB_bSu_cS_d$ as defined in claim 1 or claim 2,

adsorption, in the insolubilized dextran derivative obtained above, of at least one growth factor as defined in any one of claims 1 to 4,

production of a solid biomaterial according to any one of claims 1 to 8 in the form of a hydrogel,

optionally, the freeze-drying of said hydrogel in order to obtain said biomaterial in the form of a powder.

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16. (Amended) The process as claimed in claim 15, characterized in that said crosslinking of at least one dextran derivative of general formula $DMC_aB_bSu_cS_d$ is carried out with the aid of a crosslinking agent selected from the group consisting of sodium trimetaphosphate, epichlorohydrin, divinyl sulfone, gluteraldehyde and bisepoxiranes.

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17. (Amended) The process as claimed in claim 15, characterized in that the crosslinking of at least one dextran derivative of general formula $DMC_aB_bSu_cS_d$ is carried out in the presence of a tissue filling material.

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19. (Amended) A process for preparing the biomaterial as claimed in claim 12, characterized in that it comprises the following steps:

bringing the dextran derivative into contact with particles of an inorganic or polymeric insoluble support, as defined in claim 12, so as to obtain a composite,

insolubilization of the composite obtained above, in the presence of a crosslinking agent,

adsorption, in the insolubilized composite obtained above, of at least one of said growth factors.

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21. (Amended) The use of the solid biomaterial as claimed in claim 20 for the preparation of osteoarticular, dental or maxillofacial implants.

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